U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE UNIVERSITY OF IDAHO AGRICULTURAL EXPERIMENT STATION, J. S. JONES, DIRECTOR.

SOIL SURVEY OF NEZ PERCE AND LEWIS COUNTIES, IDAHO.

BY

J. H. AGEE, OF THE U. S. DEPARTMENT OF AGRICULTURE, IN CHARGE, AND P. P. PETERSON, OF THE UNIVERSITY OF IDAHO.

MACY H. LAPHAM, INSPECTOR, WESTERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1917.]

WASHINGTON:
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1920.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., August 20, 1919.

SIR: The field operations of the Bureau of Soils for 1917 included a soil survey of Nez Perce and Lewis Counties, Idaho. The work was done in cooperation with the State of Idaho. I have the honor to transmit herewith the manuscript report and map covering this survey, and to recommend that they be published as advance sheets of Field Operations of the Bureau of Soils for 1917, as provided by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

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SOIL SURVEY OF NEZ PERCE AND LEWIS COUNTIES, IDAHO.

By J. H. AGEE, of the U. S. Department of Agriculture, In Charge, and P. P. PETERSON, of the University of Idaho.—Area Inspected by MACY H. LAPHAM.

DESCRIPTION OF THE AREA.

Nez Perce and Lewis Counties are situated in the west-central part of the northern extension of the State of Idaho, commonly known as the "Panhandle." Lewiston, the county seat of Nez Perce County, and the largest city within the area surveyed, is about 110 miles south of Spokane, Wash. The greater part of the western boundary of the area, or a distance of about 45 miles, is formed by the Snake River, while the Salmon River forms a large part of the southern boundary. The area covered by the survey is 1,311 square miles, or 639,040 acres.

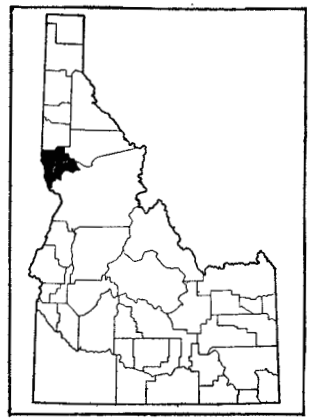


FIG. 1.—Sketch map showing location of the Nez Perce and Lewis Counties area, Idaho.

The area consists mainly of a high rolling and undulating plateau, cut into blocks by deep canyons. The resistant rock underlying and holding up the plateau is basalt. The general plateau surface has been modified throughout a northwest-southeast belt, lying immediately south of Lewiston and extending from the Snake River Valley southeasterly for a number of miles. The modification is seemingly the result of faulting, the break extending southeast and northwest; the land south of it being raised along the fault into Craig Mountain and depressed north of it into Lewiston Valley. Craig Mountain extends in a northeast-southwest direction, with its steep slope facing to the northwest. It lies about 20 miles south of Lewiston.

The lowest elevation in the area, about 700 feet, is at Lewiston, and the highest, a little over 5,000 feet, near Zaza, in the Craig Mountain district. Aside from Craig Mountain, the most striking

topographic features of the area are the deeply cut canyons. That of the Snake River is 3,000 feet deep in places.

From Lewiston and the Clearwater River lowlands there is a rapid rise to the north, forming a steep escarpment which rises to the Uniontown Plateau at an elevation of over 2,000 feet above the foot of the escarpment at the river. The width of the escarpment varies from 2½ to 5 miles. The Uniontown Plateau has a characteristic rounded, hilly topography. It extends north into Latah County, Idaho, and west into Whitman County, Wash.

The lower lying Lewiston Plateau, or Lewiston Valley, occupies that part of Nez Perce County south of the Clearwater River and east of the Snake River. It has a gentle slope to the north and west, and terminates on the south in the Craig Mountain escarpment. (Pl. I.) Its gradual rise to the east causes it to reach almost the elevation of the Kamiah Plateau, in the vicinity of Gifford.

The Craig Mountain escarpment extends northeastward from the high divide between the Snake and Salmon Rivers, and terminates in the descending slope from Lookout to Gifford. In the southern part of Craig Mountain the country is rugged and steep, and much of it is heavily timbered. Figure 2 shows this and other forested areas of the survey.

Eastward from Craig Mountain there is a gently sloping country known as the Kamiah Plateau, which extends to the Clearwater River. This plateau, which has an elevation of 3,000 to 4,500 feet, includes the Nez Perce Prairie. Masons Butte, a granite knob, is also situated on this plateau, about 4 miles southeast of Winchester.

The plateau north of the Clearwater River and southeast of Potlatch River is an extension of the Uniontown Plateau. Its elevation is between 2,500 and 3,000 feet.

The Clearwater River in particular and most of the other streams have carved deep, steep-walled canyons in the basalt plain, and the plateaus described are high, comparatively flat remnants of the plain standing between them. The Snake River flows in one of these canyons to a point about 12 miles above Lewiston, and on turning to the west at Lewiston it enters another. It has cut most deeply from the place where it has carved through the lava and penetrated the underlying old sedimentary and igneous rocks, at the mouth of the Salmon River, to the point where it is joined by the Grande Ronde River, which enters from the west a short distance north of the Washington-Oregon boundary line. The erosion along the Snake and Salmon Rivers has developed a rough topography in the southern part of the two counties.

The Clearwater River and its tributaries drain about nine-tenths of the area surveyed. The principal tributaries of the Clearwater River are Potlatch River, and Lapwai, Cottonwood, Bedrock, Jacks,

Big Canyon, and Lawyer Canyon Creeks. Very little alluvium is being deposited or has been deposited along these streams. The Snake, Clearwater, and Salmon Rivers offer great opportunities for water-power development.

Prior to 1911 Nez Perce County embraced all of the territory now included in the counties of Nez Perce, Lewis, and Clearwater, so that the census statistics up to and including 1910 cover the territory

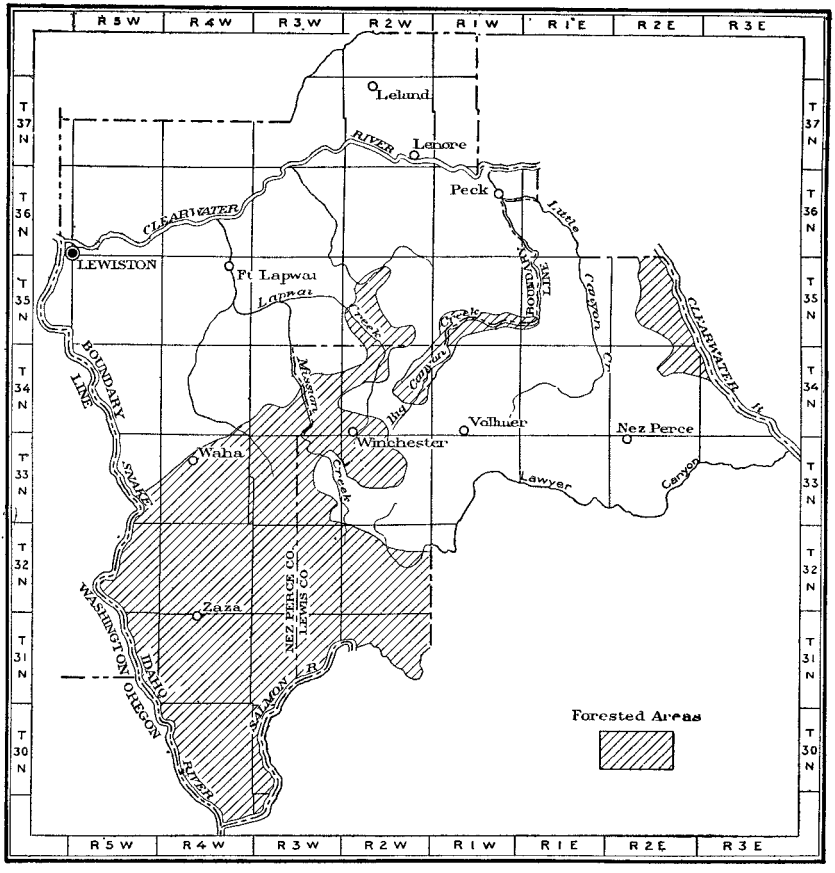


FIG. 2.—Sketch map showing forested areas.

in these three counties. The total population according to the 1910 census was 24,860. According to records in the county assessors' offices Nez Perce County had 14,350 population in 1916, Lewis County 9,500, and Clearwater 9,650.

Lewiston, the county seat of Nez Perce County, is situated on the Snake and Clearwater Rivers. It had a population of 6,043 in 1910. Including the population of Clarkston, across the river in Washington, and the suburban district, the total at present is about 10,000. Lewiston is the center of an extensive orcharding and trucking

region. It is an important commercial distributing center and has access to outside markets by branch lines of the Northern Pacific Railway and the Camas Prairie Railroad, a branch of the Oregon-Washington Railroad & Navigation System. An electric line from Lewiston to Clarkston virtually makes these two places one city. A State normal school, having an enrollment of about 500 students, is situated at Lewiston. Lewiston has three modern packing plants, with a combined yearly output of over a million pounds of meat products. A large creamery and a flour mill are also established here. The city is supplied with gas and electricity. Its water supply is obtained from the Clearwater River.

Nez Perce, the county seat of Lewis County, has a population of about 800. It is the center of a rich agricultural region, and is a shipping point for a wide area. The Nez Perce & Idaho Railroad connects this town with the Camas Prairie Railroad at Vollmer. Winchester is situated in the western part of Lewis County at an elevation of about 4,000 feet. A large lumber mill is operated here. The Craig Mountain Railway connects the town with the Camas Prairie Railroad at Craig Junction. Fort Lapwai, situated in the Lapwai Creek canyon on the Camas Prairie Railroad, about 14 miles from Lewiston, is mainly an Indian town. The United States Indian agency for the Nez Perce Indians is situated here. Kamiah, in the extreme eastern end of the area, is an important trading point for a large part of Clearwater County.

Culdesac, Gifford, Ilo, Vollmer, Peck, Lenore, Southwick, Reubens, and Leland are important local trading centers. Waha, a summer resort, is about 20 miles south of Lewiston, on the north edge of Craig Mountain.

There are 65 public schools in Nez Perce County, and 41 in Lewis County. Most of the school buildings are of modern construction. Rural mail delivery routes and telephone service reach all the settled parts of the area.

Most of the public roads in Nez Perce and Lewis Counties are in good condition during the summer, especially on the higher plateaus. The Lewiston Hill Road and the Lewiston Orchard Tract Road are of permanent construction. The hill road is a well laid out highway, making a comparatively easy climb from Lewiston to the Uniontown Plateau. The Orchard Tract Road is paved for a distance of about 8 miles out of Lewiston. In the spring and late fall the unimproved dirt roads are almost impassable.

The greater part of the area has railroad facilities. A branch of the Northern Pacific Railway from Pullman Junction to Genesee serves that part of Nez Perce County north of the Clearwater escarpment and west of Potlatch Canyon. The Clearwater Short Line, a branch of the Northern Pacific, affords shipping facilities for all the

country east of Lewiston adjacent to the Clearwater River. The Camas Prairie Railroad, operated jointly by the Oregon-Washington Railroad & Navigation Co. and the Northern Pacific Railroad, serves the Nez Perce Prairie and Camas Prairie country. The Nez Perce & Idaho Railroad from Vollmer to Nez Perce affords a ready outlet for the wheat and other farm products of the Nez Perce Prairie. The branch line of this road extending from Lewiston up the Tammany Creek Valley hauls considerable grain. The Craig Mountain Railroad connects Winchester with the Camas Prairie Railroad. It was built primarily to transport lumber products from that place.

Large quantities of fruits are shipped to the eastern markets. Under normal conditions the grain is marketed through Portland and other Pacific points. Lewiston is the principal shipping point for vegetables and orchard products.

The interstate bridge across the Snake River at Lewiston affords communication with Asotin County, Wash. It is the only wagon bridge over the Snake River within the area surveyed. The Clearwater River is bridged at Lewiston, Greer (in Clearwater County), and Kamiah, and there are ferries at Spalding, Peck, Lenore, Myrtle, and Agatha.

The Snake and Columbia Rivers give Lewiston a direct waterway connection with Portland and the Pacific Ocean. The Snake River is navigable for most of the year as far up as the mouth of the Salmon River, and at certain times of the year the Salmon River is navigable for boats going downstream below Salmon City. The boats are specially built for the down trip, and are sold at the place to which their cargoes are consigned.

CLIMATE.

The climate of the lower lying country near Lewiston resembles that of the semiarid country to the west along the Snake River in Washington. The precipitation is light, and irrigation is necessary in growing orchard fruits and vegetables. The records of the Weather Bureau station at Lewiston represent conditions for only a small area surrounding Lewiston and for the low-lying plateau to the south. The eastern part of the area surveyed and most of the higher country are better represented by the records of the Nez Perce station.

The summers in this region are dry, most of the precipitation falling during the period from September 15 to May 15. The statistics available do not indicate the amount of snowfall, but on the Nez Perce Prairie a depth of 4 feet on the level is reported to be common. Snow remains on the ground for a period of two to eight weeks in midwinter. In the vicinity of Lewiston the winters are more open, and the snow melts almost as fast as it falls. Snow remains in pro-

tected places on Craig Mountain until the 1st of June, and sometimes later.

Very few heavy windstorms occur in this region, but there are occasional dust storms during the summer. Electrical storms are of rare occurrence and are seldom destructive.

The average growing season in the lower Lewiston country is 203 days, which is ample for the production of all the general farm crops and a variety of vegetables, berries, and fruits. In the higher country the period without killing frost is much shorter, decreasing with elevation, until in the Craig Mountain section at some elevations there is killing frost every month in the year. At the Nez Perce station the average growing season is 113 days, but there is no month in the year in which killing frost may not occur. The average date of the last killing frost in the spring at Lewiston is April 6, and the average date of the first in the fall, October 26; the latest recorded killing frost in the spring occurred April 29, and the earliest on record in the fall on October 5. The average date of the last killing frost in the spring at Nez Perce is May 26, and the average date of the first in the fall, September 16; the latest recorded killing frost in the spring occurred July 13, and the earliest recorded in the fall on August 17.

Tables showing the normal monthly, seasonal, and annual temperature and precipitation as reported at the Weather Bureau stations at Lewiston and Nez Perce follow:

Normal monthly, seasonal, and annual temperature and precipitation at Lewiston, Nez Perce County.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1911).	Total amount for the wettest year (1884).
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*
December	37.5	64	4	1.52	1.07	2.79
January	34.5	62	−13	1.58	.49	2.15
February	36.2	70	−10	1.38	.53	3.10
Winter	36.1	70	−13	4.48	2.09	8.04
March	48.8	82	7	1.28	.37	1.25
April	52.9	92	24	1.13	.30	1.45
May	60.8	103	30	1.63	1.86	.50
Spring	54.2	103	7	4.04	2.53	3.20
June	69.1	104	38	1.04	1.13	5.66
July	73.6	108	41	.42	.04	1.30
August	73.1	108	42	.37	.74	.06
Summer	71.9	108	38	1.83	1.91	7.02

Normal monthly, seasonal, and annual temperature and precipitation at Lewiston, Nez Perce County—Continued.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1911).	Total amount for the wettest year (1884).
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*
September	63.5	99	29	.65	.52	1.01
October	51.8	93	21	1.20	1.19	2.08
November	40.9	81	0	1.32	.82	.36
Fall	52.1	99	0	3.17	2.53	3.45
Year	53.2	108	−13	13.52	9.06	21.71

Normal monthly, seasonal, and annual temperature and precipitation at Nez Perce, Lewis County.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1910).	Total amount for the wettest year (1916).
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*
December	27.9	57	− 7	1.44	2.18	2.06
January	25.2	60	−17	2.03	1.16	2.25
February	28.6	56	−17	1.60	1.63	3.11
Winter	27.2	60	−17	5.07	4.97	7.42
March	38.5	70	0	1.63	1.11	2.42
April	45.7	86	18	2.49	3.77	1.55
May	50.7	88	24	3.30	3.08	2.01
Spring	45.0	88	0	7.32	7.96	5.98
June	57.3	95	27	2.07	0.10	2.51
July	62.8	99	32	1.07	0.08	2.58
August	63.5	98	27	.79	0.69	0.94
Summer	61.2	99	27	3.93	0.87	6.03
September	54.3	93	23	1.38	1.54	1.89
October	45.7	78	17	1.69	1.67	0.76
November	36.3	66	− 1	1.86	4.39	1.37
Fall	45.4	93	− 1	4.93	7.60	4.02
Year	44.7	99	−17	21.25	21.40	23.45

AGRICULTURE.

In 1836 and 1837 missionaries established themselves within a few miles of the present site of Lewiston. In 1860 and 1861, when gold was discovered in the Clearwater Mountains about 75 miles east of

Lewiston, people came by thousands from Oregon and California. Along with the influx of miners came others interested in stock raising, and the Nez Perce country was closely grazed. Following the stockmen came farmers from the Walla Walla country, in search of wheat land. The prairies in the Palouse and Nez Perce sections were found productive, and all the land outside the Nez Perce Indian Reservation was soon opened. For several years after the early settlement, grain had to be freighted to points on the Snake and Clearwater Rivers and shipped by boat to Portland. After the extension of the Northern Pacific Railway to Genesee in 1887, and the construction of the line to Lewiston four or five years later, eliminating the long hauls of grain, there was an increase in acreage and production of wheat.

Wheat is by far the most important crop in the area. In 1889, according to the census, there were 11,660 acres in wheat, producing 143,419 bushels. The 1900 census showed a total of 53,178 acres in this crop, with a production of 1,110,280 bushels, and in 1909 there were 71,397 acres, producing 2,242,908 bushels. Wheat is grown on practically every farm in the two counties, except in the irrigated sections. The yields vary from 10 to 50 bushels per acre, averaging about 35 bushels. Both winter and spring wheat are grown. The leading spring variety is the Marquis. Spring seeding is often hindered and sometimes rendered impossible by the lateness of the season and by rainy weather in April and May. Both common and club varieties of winter wheat are planted. The principal varieties of club wheat are Jenkins, Red Chaff, and Little Club. The leading varieties of common wheat are Pacific, Bluestem, Fortyfold, and Red Russian. The winter crop is sown from July to the middle of October. Some farmers report that early fall planting causes the wheat to be less affected by smut, which does considerable damage annually. Some wheat is fed to the stock on the farms, but a large part of the crop is sold. Barley ranks second in importance among the cash and subsistence crops. In 1889 there were 1,520 acres in barley, which produced 30,456 bushels; in 1899, 12,565 acres, producing 380,600 bushels; and in 1909, 58,940 acres, producing 2,177,964 bushels. The acreage devoted to barley increased until the year 1915, the acreage in that year being 20 per cent and the production 30 per cent greater than for wheat. Since 1915, however, the high price of wheat has caused a great falling off in the barley acreage and a corresponding increase in the wheat acreage. Fall seeding of barley is usually done between the 1st of September and the middle of October, while spring seeding is usually done in April and May. Barley constitutes the principal stock feed, and a large part of the crop is used on the farm. Yields vary from 20 to 60 bushels per acre. A large part of the barley acreage is confined to the Nez Perce prairie.

Oats are grown both as a hay crop and for the grain. In 1889 there were 490 acres in oats, producing 12,695 bushels; in 1899, 4,673 acres, producing 166,500 bushels; and in 1909, 23,496 acres, producing 996,107 bushels. Besides the acreage grown for grain there is usually a large area in oats to be cut green for hay.

In growing grain the following rotation has been adopted by many of the farmers: First year, wheat; second year, wheat or other small grain; third year, peas or some other cultivated crop.

Very few of the farmers in Nez Perce and Lewis Counties use manure or commercial fertilizer or turn under green-manure crops. Farmers who use manure report that it is much better to apply it on the surface of the ground after the grain has started to grow than to plow it under previously to planting.

Part of the grain crop is harvested with a header or a combined harvester and thrasher, while part is cut with a binder and later thrashed. There are seven elevators in Nez Perce and Lewis Counties, and in 1917 about one-third of the grain produced was shipped in bulk.

Beans have become an important money crop within the last seven years. For 1909 the census reports 708 acres in beans with a production of 11,718 bushels. Since 1910 there has been a large increase in the acreage devoted to beans. The yields vary from 600 to 1,200 pounds per acre. The ridge between Big Canyon Creek and Little Canyon Creek, the plateau between the Clearwater and Potlatch Rivers, and a considerable area east of Melrose, are the principal bean-growing sections. The crop, however, is grown on nearly all the lower lying ridges and bench farms in the two counties. In growing beans it is important to have a good seed bed. In 1917 the crop on land which had been broken in the fall made a much better growth and yield than that on land which was broken and prepared just before planting. Until 1917 beans were drilled in rows, but the difficulty of obtaining labor and the expense of hoeing have since made it necessary to plant in check rows. This has made it possible to do much of the cultivation with horse-drawn implements, and has nearly eliminated hoeing. Planting is usually done during the month of May and the first week in June and harvesting during the last week in August and the month of September. The beans are cut by a machine which cuts three rows at a time, dragging the two outside rows to the middle row. They are then put in small cocks to dry. After curing thoroughly they are hauled and put in stacks. The crop is thrashed with an ordinary wheat thrasher, equipped with special screens, or with specially built bean hullers. The beans are sold to the warehouses in about the same manner as wheat. The fields where beans have been grown are in such good condition that wheat can be

drilled in after the beans have been harvested without additional preparation.

The 1890 census showed 7,757 acres devoted to hay, with a production of 7,336 tons. The 1900 census showed 31,738 acres in all hay crops, including grain cut green. In 1909 there were 29,073 acres in grain cut green for hay and 20,177 acres in all tame or cultivated grasses, yielding 24,117 tons of hay. This included 17,019 acres of timothy producing 19,558 tons, and 2,796 acres of alfalfa, producing 4,147 tons of hay.

Corn is grown on many of the farms in this region, in part for the grain but mainly for forage.

In 1899 there were 688 acres in Irish potatoes, producing 102,536 bushels, and in 1909, 1,465 acres, producing 244,802 bushels.

Field peas have been grown to some extent in Nez Perce and Lewis Counties. Yields have been satisfactory, and the crop promises to become of some importance.

Fruit culture in the Lewiston country is highly developed. In the Lewiston Orchard Tract there are several hundred acres of fruit land under irrigation, producing apples, pears, cherries, and apricots of high quality. At the Indian Cache Ranch, situated partly in the Clearwater River bottoms and partly on the low bench on the north side of the Clearwater River, grapes and apples are grown principally.

The leading varieties of apples grown are the Rome Beauty, Jonathan, Esopus (Spitzenberg), Yellow Newtown, Winesap, Delicious, and Banana. The 1900 census reported a total of 152,612 apple trees in Nez Perce County (comprising the territory of Nez Perce, Lewis, and Clearwater Counties), and the 1910 census a total of 110,352 trees.

Grape growing is of considerable importance, the varieties commonly planted including several of the vinifera sorts and the Concord among the native varieties. The 1910 census reports a total of 36,969 grapevines in Nez Perce County, with a production in 1909 of 237,601 pounds. This is a considerable increase over the 136,700 pounds reported for 1899, from 25,444 vines.[1]

Cherries are an important crop in this area. The quality of the fruit is excellent. In 1909 there were 16,910 cherry trees in Nez Perce County. The varieties of cherries most successfully grown include the Bing, Napoleon (*Royal Ann*), and the Lambert. The Bing is the leading commercial variety for shipping in the fresh state, while the Napoleon is used chiefly for canning.

[1] The statistics of fruit growing taken from the census of 1910 are given as the best available. Many changes have taken place in the last 10 years. The figures at least show for what crops the soils may be used.

Other fruit crops of the area include prunes and plums, pears, strawberries, raspberries, blackberries, gooseberries, and currants. The 1910 census reports a total of 19,280 plum and prune trees and 10,348 pear trees in Nez Perce County.

The census reports 55 acres devoted to strawberries, with a production in 1909 of 64,446 quarts. Over 30,000 quarts of raspberries and Logan blackberries were produced from 29 acres, and 12,833 quarts of other blackberries and dewberries from a total of 8 acres. Eight acres in gooseberries produced 5,410 quarts, and 7 acres of currants 7,114 quarts.

During 1917, fruit companies operating in Lewiston shipped over 500 carloads of apples, 65 carloads of cherries, and 190 carloads of assorted peaches, pears, prunes, plums, and berries. In addition, one packing company canned 45,000 cases of apples and 30,000 cases of cherries.

Besides the fruits and berries grown there are produced large quantities of vegetables. A large part of the vegetable crop is grown in the commercial-orchard areas. Cabbage, lettuce, beets, carrots, peppers, tomatoes, and squash are produced in large quantities and are sold principally in the mining districts of northern Idaho and Montana. In 1910 the value of the vegetable products of Nez Perce County was $222,617. On almost every farm from 1 to 5 acres is used for a home orchard and for growing berries and vegetables.

Stock raising is of considerable importance in this area. In the thinly populated section in the southern part of Nez Perce and Lewis Counties native pasturage is plentiful, and there is good shelter during the winter months in the coves along the Salmon River and its tributary canyons.

Hogs are raised on nearly every farm, for home consumption and for sale. The Duroc-Jersey is kept almost exclusively. There has been a large decrease in the number of hogs on the farms since the advance in the price of grain.

Heavy draft horses are used on the farms, and the horses raised are almost entirely of the heavy-draft type, principally Belgian, Clydesdale, Percheron, and Shire. Most of the horses used on the farms are raised within the area. The Northwest Livestock Show, which is held every fall in Lewiston by the Northwest Livestock Association, has been instrumental in improving the quality of the stock raised in the Nez Perce region.

There are three commercial dairies near Lewiston, with a total of about 175 cows. Nearly every farmer in this part of the area

produces a surplus of milk and butter, most of which is sold to the creamery at Lewiston.

In the table below is given the value of the agricultural products of Nez Perce County[1] by classes, according to the 1910 census:

Value of agricultural products, by classes, 1909.

Product.	Value.	Product.	Value.
Cereals	$3,350,272	Live stock and products:	
Other grains and seeds	43,186	Animals sold or slaughtered	$721,193
Hay and forage	698,661	Dairy products, excluding home use	120,597
Vegetables	222,617	Poultry and eggs	116,312
Fruits and nuts	128,080	Wool, mohair, and goat hair	8,600
All other crops	162,027		966,702
	4,604,843	Total	5,571,545

A considerable part of Nez Perce and Lewis Counties remains in forest. On the accompanying sketch map (fig. 2, p. 7) there is indicated the approximate outlines of the forested area. The growth consists mainly of yellow pine, fir, spruce, tamarack, and lodgepole pine. Owing to the distance of the timbered areas from shipping points, the amount of lumber cut each year is comparatively small.

A large part of the farm work in this region is done by the farmer and his family, as farm labor is expensive and difficult to obtain. Farm hands are paid from $30 to $60 a month with board. For labor hired by the day and during harvest time the wages paid are much higher. The amount expended for farm labor in 1909 was $594,548.

Most of the farm buildings in the two counties are of good construction and are well kept. Plate II, figure 1, shows the buildings on a typical up-to-date farm. The machinery on all of the farms is modern, and usually well housed. The work stock is well fed and otherwise well cared for.

SOILS.

The soils of the area fall under four main groups, residual soils, loessial soils, soils derived from old water-laid valley-filling material, and recent alluvial soils.

The residual soils of the area are derived from basalt and granite, the former being widely distributed over the survey and the latter being confined to the country immediately surrounding Masons Butte and to smaller areas near Craig Junction and east of Russell.

The loessial province is represented by brown to nearly black soils of uniform silty texture that are probably due to wind deposits.

[1] Nez Perce County until 1911 embraced all the territory now included in the counties of Nez Perce, Lewis, and Clearwater.

VIEW FROM CLEARWATER ESCARPMENT, SHOWING LEWISTON PLATEAU AND THE LOW
THE CITY OF LEWISTON IS LOCATED.

Clearwater River in the foreground forming junction with Snake River on the right. Craig Mountain e

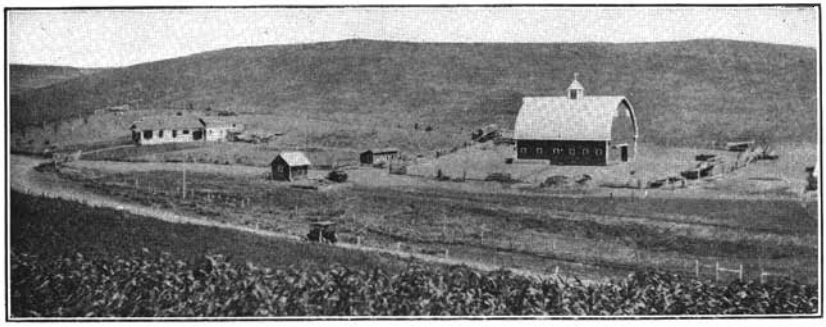


FIG. 1.—VIEW SHOWING MODERN FARM BUILDINGS WHICH ARE DISPLACING THE FORMER TEMPORARY STRUCTURES IN THE PALOUSE COUNTRY.

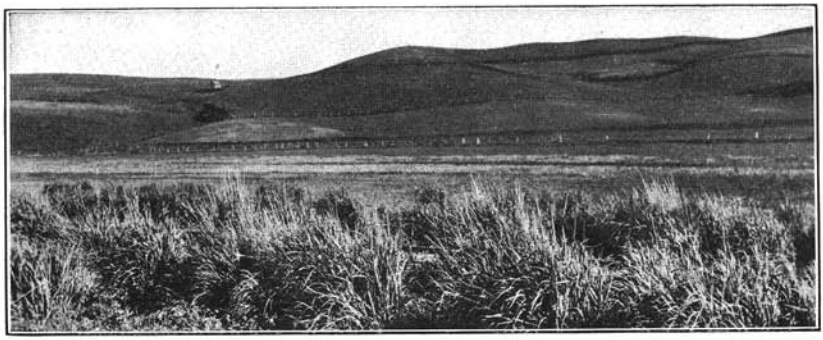


FIG. 2.—CALDWELL SILT LOAM IN LOCAL VALLEY SOUTH OF GENESEE ON THE UNIONTOWN PLATEAU.

The Palouse silt loam occupies the rolling hills in the distance. Bunch-grass vegetation in foreground which formerly covered the Palouse Country.

S. 9514

FIG. 3.—GENERAL VIEW SHOWING TOPOGRAPHY AND GRAIN ON THE NEZ PERCE SILT LOAM.

This mantle of loessial material covers the basalt plateaus and the lower slopes of the buttes, and gradually thins out in the zone of contact with the residual soils. In such localities the boundary between the residual and loessial material is usually indefinite, and may be somewhat arbitrarily indicated on the soil map. The loessial soils in such parts of the survey frequently include an admixture of residual material, while the residual soils include an admixture of loessial material.

The old valley-filling soils have been derived by the weathering and modification of material deposited by water in the basin at the confluence of the Snake and Clearwater Rivers and now occupying more or less elevated terraces and slopes along the stream valleys. The underlying material consists of coarse gravel to small bowlders, and is covered by stratified finer material consisting mainly of silt and sand. As in the case of the residual soils, the surface material is usually modified by an admixture of loessial material and to an extent often difficult to determine.

The recent alluvial soils consist of sediments brought down by the streams and deposited in the present flood plains along their courses.

In the scheme adopted by the Bureau of Soils the type is the unit of classification and mapping. The type includes all occurrences of soil of identical or very similar characteristics in color, texture, structure, depth of subsoil or substratum, origin, and mode of formation. Minor variations or local departures from these typical characteristics that are not of sufficient importance or extent to separate as distinct types are identified as phases. The soil series includes types having a common origin and mode of formation, and similar characteristics in color and nature of subsoil, but differing in texture, that is, in their content of sand, silt, and clay.

In the survey 9 series of soils are recognized, represented by 13 soil types and phases, in addition to three nonagricultural types—Rough mountainous land, Rough stony land, and Riverwash.

The amount of detail with which the soils are classified and mapped is variable from place to place. In the accessible and developed agricultural districts all the boundaries are closely worked out except where certain of the soil types merge so gradually that the boundaries have to be more or less arbitrarily drawn. In the rougher, more inaccessible and forested parts of the area, which are sparsely settled and in which roads are few or altogether wanting, detailed field traverse is impracticable without unwarranted expenditure of time and funds, and the soils are mapped with less detail, largely in miscellaneous groupings. This is the case particu-

larly in the dissected, rugged, and forested parts of the Craig Mountain plateau.

The residual soils of the area are classed in the Tolo, Waha, and Moscow series; the loessial soils in the Palouse, Nez Perce, and Southwick series; the old valley-filling soils in the Sagemoor series; and the recent alluvial soils in the Beverly and Caldwell series.

The soils of the Tolo series are derived from basaltic or similar basic-igneous rocks or metamorphosed igneous rocks. As mapped in previous surveys the parent material has consisted mainly of greenstone, diabase, or other altered rocks, and the soils have often been brown or reddish brown. In the present survey where the Tolo soils are derived from the basalt of the great Columbia-Snake River Plateau, the surface soils are predominantly brownish yellow to pale yellow and underlain by yellow to pale-yellow subsoils. The series here is usually heavily forested. The soil and subsoil material is usually shallow, underlain by the parent bedrock at a depth of a few feet, and with much rock outcrop in places. The topography is rolling to mountainous and the drainage well developed.

The soils of the Waha series are brownish gray to black in color. The subsoil is dark brown to nearly black, generally somewhat heavier or more compact than the surface soil. The Waha soils are derived from basaltic or similar basic-igneous rocks. In this area the soils are usually shallow and underlain by basaltic bedrock at a depth of but a few feet. They occupy undulating plateau and prairie surfaces and locally include poorly drained flats and shallow undrained depressions. The soils as mapped have probably been modified somewhat by loessial material, and some of the included material may be mainly of loessial origin. The series as mapped in this survey includes some very dark brown soil in which the typical gray or black color is not strongly developed.

The surface soils of the Moscow series are light brown to brown, with light grayish brown to yellowish brown variations. They overlie grayish-yellow to reddish-brown or pale yellow subsoils. The deeper subsoil frequently consists largely of disintegrated rock, and grades into a substratum of bedrock. The Moscow soils are residual from the weathering of granite, schists, gneisses or similar quartz-bearing crystalline rocks, but are influenced in some places by an admixture of fine-grained loessial or wind-laid material. They are developed on buttes and mountain slopes in Idaho and Washington. Drainage is well developed, and frequently excessive. The soils of this series were originally forested.

The surface soils of the types included in the Palouse series are dark grayish brown to black, the brown tint being most pronounced when the soil is dry. A high content of organic matter causes the surface soil to appear black when wet. Ordinarily, the subsoil is

slightly heavier and more compact than the surface soil, but it is generally friable. The upper subsoil is light brown to brown in color, and the deeper subsoil yellowish brown or tawny yellow. It is underlain by a deep substratum of yellowish fine homogeneous material, without stratification. The Palouse soils are developed in the rolling or hilly, prairie country of eastern Washington, and over the western part of northern Idaho. Drainage is well established. The soils are derived from fine-textured material, seemingly of wind-laid origin, which has apparently accumulated during long periods of time from dust borne for long distances by the winds and settled from atmospheric suspension. This material now forms a mantle over the Columbia River basalt and the lower parts of the granite hills. The Palouse soils are differentiated from the soils derived from similar material developed in the less humid sections of Washington and Idaho in being less calcareous and much darker in color. They are differentiated from the other dark-colored soils of similar origin in this survey in that the subsurface gray layer and tough compact subsoil developed in the other soils of dark color are absent. There is usually a zone of calcareous material in the substratum, occurring generally below the 3-foot section, except in the northwest part of the county where the soil is subject to less rainfall.

The Nez Perce series is characterized by dark grayish brown to black soils, with a gray or grayish-brown subsurface layer 2 to 6 inches thick of about the same texture as the surface soil, but compact and relatively impervious. The subsoil is reddish brown or brown, sometimes mottled with gray or brown, and is dense and compact in structure. It is normally heavier in texture than the soil, containing less silt and more clay. The topography of the Nez Perce soils is rolling to gently undulating, and less hilly than that of the Palouse series. The surface drainage is well developed, but the subdrainage is slow. The Nez Perce soils are derived from material similar to that giving rise to the Palouse series. They occupy prairies and include some adjacent parklike areas, timbered with yellow pine. The series differs from the Palouse in its compact, gray subsurface layer, and in its more compact and heavier lower subsoil. The loess deposits where this soil is developed range in depth from 2 to 15 feet, but in general the soil is derived from comparatively thin deposits and the subsoil material may have been modified to a greater or less extent by residual material from the underlying basaltic rocks. The deeper subsoil sometimes includes small lime accumulations, but these do not appear to be consistently developed and they are much less frequent than in the soils of the Palouse series, which are generally subject to somewhat lower rainfall.

The types in the Southwick series have dark-brown or dark grayish brown soils and lighter or more reddish brown compact

subsoils of similar or slightly heavier texture. The organic content of the soil is moderately large. No calcareous accumulations are encountered in the subsoil. The Southwick soils are derived from loessial deposits which are thin or of only moderate depth, and the subsoil material may be modified by or formed largely of residual material from the underlying basalt. The soils occupy elevated plateaus or plains which were at one time covered with a growth of yellow pine. The surface is undulating to gently rolling, and drainage in most places good. The soils of this series are differentiated from the related Palouse and Nez Perce soils by their lighter brown color and lower content of organic matter. The subsoil is also more compact and has a more pronounced brown color than the Palouse, and the series lacks the compact gray subsurface layer of the Nez Perce soils.

The members of the Sagemoor series have brown soils with light grayish brown variations. The subsoils are lighter brown or light grayish brown to gray, and calcareous. They frequently dry out to a light-gray color when exposed. They are underlain by a substratum of rather compact sediments, ranging in texture generally from fine sand to silt. The Sagemoor soils are derived from the weathering in place of stratified water-laid deposits which may be either lake-laid or stream-laid, and which usually have been modified to a variable extent by an admixture of loessial material, and, as mapped, the surface soil in places may be mainly of loessial origin. The Sagemoor soils have been derived from a wide range of rocks and the deposits are now undergoing erosion. The topography ranges from sloping or undulating to somewhat hilly, and the drainage is good to excessive. The soils of this series have been subject to limited rainfall, and lime concentrations have taken place in the subsoil.

The surface soils of the Beverly series are light brown to brown. The subsoils are of similar or slightly lighter brown color and of similar or coarser texture. They are usually permeable, and are underlain by a porous gravel stratum at depths usually within 6 feet. The Beverly soils consist of recent alluvial deposits derived from a mixture of rocks, both granite and basalt being conspicuous in the gravel. The surface material of the lighter textured types has been modified somewhat by winds in places, and the topography may be hummocky. Otherwise the surface is level. Some of the included material in this area is predominantly of basaltic origin and is darker colored than is typical of the Beverly series.

The surface soils of the types included in the Caldwell series is dark brownish gray or dark gray to black in color, and generally high in organic matter. The subsoil is gray or dark gray to drab, sometimes mottled with brown and gray, and in places underlain by

mottled yellowish-brown or yellow strata. Slight accumulations of lime occur in places in the subsoil, but they are not characteristic of the series. The Caldwell soils consist of recent alluvial deposits washed from Palouse and similar dark-colored loessial soils. The surface is level or gently sloping and drainage inadequate, numerous swampy or meadowlike areas being encountered.

In the following pages of this report the various soils of Nez Perce and Lewis Counties are described in detail and their relation to agriculture discussed. The accompanying map shows the distribution of the various soils, and the table below gives the name and the actual and relative extent of each type mapped:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Rough stony land	195,200	23.3	Moscow loam	9,728	1.2
Rough mountainous land	162,816	19.4	Sagemoor very fine sandy loam	6,528	.8
Palouse silt loam	137,984	16.4	Beverly fine sandy loam	6,464	.8
Nez Perce silt loam	69,760	11.9	Beverly loam, dark-colored phase	3,008	.4
Friable-subsoil phase	30,336		Caldwell silt loam	2,752	.3
Southwick silty clay loam	96,960	11.5	Riverwash	384	.1
Waha silt loam	51,200	6.1			
Tolo silt loam	35,008	5.9	Total	839,040	
Shallow phase	14,720				
Sagemoor silt loam	16,192	1.9			

TOLO SILT LOAM.

The surface soil of the Tolo silt loam is a brownish-yellow to pale-yellow silt loam, extending to a depth of 6 to 10 inches, underlain by a rich brownish-yellow to yellow silt loam. Bedrock is usually encountered at depths less than 3 feet.

In color and general physical characteristics this soil is similar to the Helmer silt loam mapped in the adjoining survey of Latah County. The Helmer soil is considered as mainly loessial in origin, but it is possible that the two types have much in common and that the Tolo silt loam here includes more or less loessial material.

The Tolo silt loam is extensively developed on the highest part of Craig Mountain and the slopes to the east. There are a number of small areas in the vicinity of and north of Zaza, while a large body extends from a point about 7 miles west of Forest eastward across the southern part of the survey and into Idaho County. The surface ranges from rolling to steep and mountainous. Drainage is well established.

Very little of the Tolo silt loam is under cultivation. It supports a heavy growth of yellow pine, fir, spruce, tamarack, and lodge-pole pine, and its present selling value is based largely on the stand

of timber. The type affords good grazing for sheep and cattle, and it is used mainly for that purpose.

Tolo silt loam, shallow phase.—The Tolo silt loam, shallow phase, covers an area of shallow soil in the Craig Mountains. In these areas the soil is so thin over the bedrock that the land is unsuited for cultivation.

The phase is moderately extensive and occurs in the southern part of the survey. The principal developments are mapped in the vicinity of Zaza, and south, southwest, and west of Forest and Winchester. The phase is associated with Rough mountainous land, into which it gradually merges in places.

The timber growth is not as heavy as on the typical Tolo silt loam. The phase affords good grazing, and is used as grazing land.

The following table gives the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the typical Tolo silt loam:

Mechanical analyses of Tolo silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540619	Soil	2.7	3.3	1.4	9.0	19.5	55.6	8.7
540620	Subsoil	3.2	2.7	1.3	9.0	20.8	56.5	6.6
540621	Lower subsoil	3.4	5.9	2.4	9.2	17.2	43.3	18.9

WAHA SILT LOAM.

The Waha silt loam, to a depth of 10 to 12 inches, consists of a dark-gray or dark brownish gray to black silt loam, underlain to about 24 inches by a dark-brown compact silty clay or silty clay loam. Bedrock is usually encountered at 20 to 30 inches, and small patches of rock outcrop occur throughout the type. Some of the soil mapped with this type appears in the field to be somewhat heavier than typical, approaching a clay loam in texture, and there is also included with the type some material of probable loessial origin. In fact most of the type is influenced somewhat by loessial material, though it is considered as mainly residual from the underlying basaltic rock.

The Waha silt loam is one of the most widely distributed soils of the survey. It generally occurs in small and irregular areas. In the western part of the survey it is associated mainly with the Palouse silt loam and Rough stony land, and in the central and eastern parts with the Southwick silty clay loam, Nez Perce silt loam, and Rough stony land. A large number of small scattered bodies are interspersed with areas of Rough stony land along the valley of the Clearwater River, particularly in the vicinity of Peck, Myrtle,

Lenore, Agatha, and Summit, while others, generally of smaller size, are scattered over the eroded regions and about the lower marginal slopes of the Nez Perce Prairie in eastern Lewis County. The heavier variations occur principally west of Waha, southwest of Nez Perce, and west of Kamiah.

In the larger areas of this type, the deeper parts are used for growing grain and the shallower for grazing. On the Nez Perce Prairie the narrow strips of this soil bordering the drainageways are used mainly for grazing. The soil is not as productive as the associated silt loam of the Nez Perce series, probably owing to its shallowness rather than to any difference in inherent fertility.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Waha silt loam:

Mechanical analyses of Waha silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540617	Soil	0.6	1.0	0.6	4.0	12.0	64.8	17.0
540618	Subsoil	.3	.6	.5	3.1	11.0	61.4	22.8

MOSCOW LOAM.

The Moscow loam, to a depth of 6 to 8 inches, consists of brown to yellowish-brown silty loam, underlain by yellowish-brown loam. The subsoil in most places contains small fragments of sharp granitic material. It is here and there of silt loam texture, and for the most part compact in the lower depths. There is a gradation from the surface downward into the decomposed granite and finally into the unweathered granite. Some of the surface material may have been modified by an admixture of loess, and it is possible that some of the included soil may be composed largely of loess.

The largest area of Moscow loam occurs in the western part of Lewis County, southeast of Winchester, around Masons Butte. Other smaller areas are mapped extending southward from near Craig Junction, and east of Russell.

That part of the type immediately surrounding and lying on Masons Butte is rough and heavily timbered with yellow pine, fir, spruce, and tamarack. Some of this soil area has been cleared and is in cultivation. Timothy and oats give good results. Wheat is grown to a small extent. On part of the area east of Russell wheat yields about the same as on the Nez Perce silt loam.

Land values on the Moscow loam vary from $10 to $75 an acre. The lower prices represent heavy stump land, and the higher prices apply to areas cleared and under cultivation.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Moscow loam:

Mechanical analyses of Moscow loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540613	Soil	2.2	5.2	2.4	10.0	14.2	51.9	14.1
540614	Subsoil	1.0	5.0	3.4	17.8	12.4	43.8	16.8

PALOUSE SILT LOAM.

The Palouse silt loam, to a depth of 10 to 15 inches, is a dark brownish gray to black silt loam, underlain to a depth of 20 to 30 inches by a brown to yellowish-brown silt loam to silty clay. The lower subsoil and substratum, which in most places extends to a depth of many feet, are a yellowish-brown silt loam to silty clay. The lower subsoil in places is calcareous, but the type as a whole in this survey is noncalcareous, at least within the 3-foot section. The area on the Uniontown Plateau is noncalcareous, except next to the escarpment overlooking the Clearwater River. The calcareous material is very close to the surface at the edge of the escarpment, and there is strong effervescence of the material with dilute hydrochloric acid at a depth of 10 inches. The area to the west of Lapwai Creek is calcareous in part, but most of the calcareous material is below the 3-foot section. The slopes drained by Tom Beal Creek show calcareous material in the subsoil near Lapwai Creek.

The type is derived from loess. In the vicinity of Gifford, in Nez Perce County, the Palouse silt loam is dissected by lateral canyons tributary to Cottonwood Creek, and the loessial soil material is not so deep as on the Uniontown Plateau. The depth ranges from 2 to 10 feet, whereas on the Uniontown Plateau the loessial mantle is often 50 feet deep.

The Palouse silt loam is one of the most extensive and uniform soils of the survey. It occurs principally in the northern and central parts of the county. The soil areas are usually large and bounded by marginal areas of Waha silt loam and Rough stony land, which occupy the eroded slopes of the plateaus. The largest and more important areas occupy the Uniontown Plateau and portions of the Lewiston Plateau. The type here extends southward to the Craig Mountains and eastward to the vicinity of Gifford and Culdesac. A large and important area is mapped north of the Clearwater River and east of Potlatch River in the vicinity of Leland. Small isolated areas lie northeast of Lenore and Peck.

The topography of the Palouse silt loam ranges from gently sloping or undulating to hilly. The area on the Uniontown Plateau is rolling to hilly. (Pl. II, fig 2.) That to the west of Lapwai Creek is gently rolling, while on the slopes drained by Tom Beal Creek the type is gently sloping.

The topography is everywhere smooth enough to permit the use of the combined harvester and other labor-saving farm machinery.

This soil was originally heavily covered with bunch grass, in addition to a scattered bushy growth of wild rose, snowberry, and buckbush. This brushy growth spreads as the bunch grass is more closely grazed.

All of the type is now under cultivation, wheat, barley, oats, beans, and timothy being the principal crops. Wheat gives yields averaging over 35 bushels per acre. Many of the fields have been in cultivation to wheat for a period of over 40 years, with little apparent lowering of the productiveness. The yields of oats range from 30 to 80 bushels per acre. The acreage in beans is considerable. A large part of the beans grown in this region are produced on the ridge between Potlatch River and Bedrock Creek. The area in beans on each farm varies from 1 to 40 acres, and the yield ranges from 600 to 1,200 pounds per acre. Timothy gives good returns, from 1 to 3 tons per acre. The yield of barley ranges from 30 to 55 bushels per acre. The acreage in barley has decreased considerably in the last two years, owing to the great demand for wheat. Irish potatoes do well on this soil, yielding from 75 to 200 bushels per acre. Apples, pears, and cherries give good results.

The selling price of land of the Palouse silt loam varies from $50 to $150 an acre.

The following table gives the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Palouse silt loam:

Mechanical analyses of Palouse silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540601	Soil	0.1	0.2	0.2	2.1	22.9	57.2	17.2
540602	Subsoil	.0	.1	.1	1.6	21.7	57.2	19.4
540603	Lower subsoil	.0	.1	.1	1.3	23.3	56.2	18.6

NEZ PERCE SILT LOAM.

The Nez Perce silt loam consists of 6 to 8 inches of dark brownish gray, or very dark grayish brown to black silt loam. Underlying the surface soil and extending to a depth of 10 to 15 inches is a com-

pact, gray to brownish-gray layer, ordinarily of the same texture as the surface soil, but relatively impervious. It is not calcareous, though its appearance suggests the presence of lime. Below this gray layer the soil changes abruptly to a brown or reddish-brown heavy, compact silty clay or clay. The lower subsoil in places is calcareous, but for the most part calcareous material either lies below the 3-foot section or is lacking.

The Nez Perce silt loam is an extensive and uniform soil, lying in the Nez Perce Prairie, in the southeastern part of the survey. The principal area extends from the vicinity of Masons Butte eastward to the eroded margin of the plateau. On the north, in the vicinity of Fletcher and Mohler, the type is bounded by areas of the associated friable-subsoil phase. The western boundaries of the type are formed mainly by the Southwick silty clay loam into which the Nez Perce soil gradually passes, and as mapped some areas of the Southwick series may be included. Smaller bodies of the Nez Perce silt loam occur north of Farmington Ridge in southeastern Nez Perce County, and southeast of Melrose.

The topography is gently rolling to undulating, much smoother than that of the Palouse silt loam, and well suited to the use of tractors and other labor-saving machinery. Surface drainage is well developed, but subdrainage is retarded by the compact subsoil. All the soil is in cultivation. Large yields of wheat are produced, averaging over 35 bushels per acre. (Pl. II, fig. 3.) The acreage in this cereal in 1917 was double that of any other. Barley is grown extensively, its acreage up to 1916 equaling that of wheat and oats combined. The great demand for wheat during the last few years has caused a falling off in the acreage devoted to barley. Yields of barley range from 30 to 65 bushels per acre, with an average of about 40 bushels.

Oats and timothy are the chief hay crops on this type. They give about the same yields as on the Palouse silt loam. Small patches of alfalfa are grown, but owing to the shortness of the season only one cutting is generally made, and the yield is so light that the acreage will probably continue to be small. Some corn is grown for ensilage, with yields of 6 to 8 tons per acre. A considerable acreage of field peas was planted in 1917. Although the season was exceptionally poor, satisfactory yields were obtained. Apples, pears, cherries, prunes, and plums do well on this soil.

The range in the price of farm land consisting of this soil is $50 to $150 an acre.

Nez Perce silt loam, friable-subsoil phase.—The Nez Perce silt loam, friable-subsoil phase, to a depth of 6 to 10 inches, is a dark brownish gray to black silt loam, underlain to a depth of about 20 inches by a brown silty clay loam to silty clay. The lower subsoil

is a heavy noncalcareous, brown silty clay. The type differs from the typical Nez Perce silt loam in lacking the compact subsurface layer.

This phase occurs on the Nez Perce Prairie and is moderately extensive, although of somewhat less extent than the typical silt loam.

It is mapped principally north of Vollmer, Fletcher, and Mohler, and south of Russell. Like the typical silt loam, it is interrupted by narrow, irregular strips of Rough stony land and of Waha silt loam.

The phase is somewhat more rolling than the typical soil. It originally supported a rank growth of bunch grass, and along the contact with the Southwick silty clay loam, some scattered yellow pine.

The Nez Perce silt loam, friable-subsoil phase, is used for about the same crops as the typical silt loam. The yields on the phase are slightly better than on the typical soil.

The following table gives the results of the mechanical analyses of samples of the soil, subsurface soil, subsoil, and lower subsoil of the typical Nez Perce silt loam:

Mechanical analyses of Nez Perce silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540604	Soil	0.0	0.5	0.3	3.3	12.5	63.3	19.9
540605	Subsurface	.2	.7	.6	4.0	15.1	62.7	16.3
540606	Subsoil	.0	.5	.3	1.4	9.5	39.7	48.7
540607	Lower subsoil	.1	.3	.3	1.6	9.3	44.1	44.3

SOUTHWICK SILTY CLAY LOAM.

The Southwick silty clay loam consists of 4 to 8 inches of a dark grayish brown silty clay loam, the color being slightly lighter than in the Nez Perce and Palouse silt loams. The subsoil is a light reddish brown or light-brown silty clay loam to silty clay of compact structure. The type includes that part of the loessial soils of the area which formerly supported a scattered stand of yellow pine and a considerable growth of bunch grass. The surface soil usually is not as deep as that of the Palouse silt loam.

This is an extensive and widely distributed soil type. It occupies a considerable area on the plateau on which the town of Southwick is situated. The type borders the prairie soils in the two counties.

In general, the Southwick silty clay loam is quite uniform, but it merges gradually with the associated Palouse silt loam, Tolo silt loam, Nez Perce silt loam, and Waha silt loam, and the boundaries are in places somewhat arbitrarily drawn. The type is traversed

by deeply eroded stream channels and canyons, with their associated areas of Rough stony land. The most extensive areas of Southwick silty clay loam lie in the vicinity of Southwick, Melrose, Lookout, Russell, and Reubens.

The topography of the Southwick silty clay loam is not as hilly as that of the Palouse silt loam, and in the areas between Reubens and Melrose it is gently undulating. The depth of the loessial material is probably nowhere over 15 feet, and the material overlying the bedrock of basalt thins out until in a few places the rock is exposed, especially on the west and south slopes south of Lookout and in the vicinity of Reubens.

Although the content of organic matter is lower than that of the associated prairie soils, the Southwick silty clay loam is very productive. Wheat, oats, barley, and timothy give very good returns, and the type is especially adapted to bean growing, the yields varying from 800 to 1,400 pounds per acre. (Pl. III, fig. 1.) The type when cleared is considered to have about the same value as the prairie soils.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Southwick silty clay loam:

Mechanical analyses of Southwick silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
40611.....	Soil.....	0.3	1.1	0.5	2.3	11.1	59.0	25.6
540612.....	Subsoil.....	.1	1.2	.6	3.0	11.7	55.6	27.6

SAGEMOOR VERY FINE SANDY LOAM.

The Sagemoor very fine sandy loam consists of 8 to 12 inches of brown very fine sandy loam, underlain to a depth of 16 to 24 inches by a brown to light-grayish brown material of similar texture. The subsoil material below this depth is a light-gray highly calcareous, very fine sandy loam. The underlying substratum (Pl. III, fig. 2) consists of interbedded silts and fine sands, overlying stratified beds of compact and partially cemented gravel.

This type of soil covers a total of a little more than 10 square miles. It is confined mainly to the northwestern part of the survey, where it is identified with the terraces and slopes of the Clearwater River and Lapwai Creek Valleys. A small area of the type occupies a bench upon which Kamiah is situated, at the junction of Lawyer Canyon and the Clearwater River in the southeastern part of the survey. The areas to the north of the Clearwater River are somewhat more rolling and the soil material shallower than in the area in the vicinity of Lewiston.

The Sagemoor very fine sandy loam is used principally in the grape industry. Both vinifera and native varieties of excellent quality are produced.

The following table gives the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Sagemoor very fine sandy loam:

Mechanical analyses of Sagemoor very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540627	Soil	0.0	1.7	2.3	16.9	35.7	35.9	7.3
540628	Subsoil	.2	1.6	2.9	21.3	33.6	34.8	5.6
540629	Lower subsoil	.2	1.8	2.5	17.9	39.2	32.6	6.2

SAGEMOOR SILT LOAM.

The Sagemoor silt loam consists of a brown to rather dark brown silt loam, about 8 inches deep, underlain by a somewhat lighter brown silt loam to about 24 inches. The material changes to light gray in the lower subsoil, which is highly calcareous and of fine sandy loam or loam texture.

This type occurs on the Lewiston Plateau, north of Tammany Valley. Its largest and most typical development is included in the Lewiston Orchard Tract. Small areas of valley-filling material, occupying local alluvial-fan slopes in the Tammany Creek Valley, a short distance southeast of Lewiston, have been mapped as this type. Here some of the surface material may be of comparatively recent alluvial origin. The soil of these areas is slightly darker than typical and lacks the stratified substratum of the typical Sagemoor soils. The plateau surface occupied by the Sagemoor silt loam is in part dissected by stream canyons. On the east the type merges with the Palouse silt loam, the boundary here being rather indefinite and the type as mapped probably including some areas of the Palouse soils.

Owing to its smooth and gently sloping surface, the Sagemoor silt loam is well suited to irrigation, and some large commercial orchards are established on it. Apple, pear, cherry, plum, and prune trees make rapid growth and yield well. Small acreages here and there are devoted to berries and vegetables, which give large returns with proper care. The principal orchard area is divided into 5, 10, and 20 acre tracts. The unirrigated part of the type is used in growing wheat, corn, beans, and peas, but owing to the scant rainfall the yields are not as large as on the higher plateaus.

Irrigated land of the Sagemoor silt loam ranges in price from $200 to $1,000 an acre, and unirrigated land from $75 to $150 an acre.

The following table gives the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Sagemoor silt loam:

Mechanical analyses of Sagemoor silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540622	Soil	0.2	0.4	0.4	4.7	32.9	61.2	0.6
540623	Subsoil	.0	.2	1.0	5.7	34.4	50.5	8.2
540624	Lower subsoil	.1	.5	.5	5.6	38.1	39.3	15.7

BEVERLY FINE SANDY LOAM.

The Beverly fine sandy loam consists of 10 to 15 inches of brown fine sandy loam, underlain by brown to light-brown or light yellowish brown fine sandy loam to a depth of 3 feet or more. In most areas the subsoil is underlain by a substratum of porous gravel and bowlders within 6 feet of the surface. The soil and subsoil both contain much finely divided mica.

The Beverly fine sandy loam is of small extent and unimportant in the local agriculture. Small bodies occupy portions of the alluvial bottoms of the Clearwater River in the vicinity of Lewiston and Spalding, and between Myrtle and Lenore. A small area also lies along the Clearwater River at Kamiah. Areas too small to map are included with the Beverly loam, dark-colored phase. Others occur at intervals in the canyon bottoms of the larger streams.

The type consists of recent-alluvial deposits of the larger streams. It is subject to occasional overflow in places, but is otherwise well drained. Owing to the smooth surface, friable surface soil, and its protected situation in the stream canyons the type is well suited to vegetable and fruit growing.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Beverly fine sandy loam:

Mechanical analyses of Beverly fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540630	Soil	0.1	1.6	4.3	44.3	27.2	18.6	4.1
540631	Subsoil	.0	.8	2.4	39.4	28.9	24.0	4.6

BEVERLY LOAM, DARK-COLORED PHASE.

The Beverly loam in this survey is not typically developed, the material correlated with this type really representing a rather dark colored phase derived to a greater extent than typical from basaltic rocks. Some of the included material is predominantly of basaltic

origin, and were the soil of greater extent and importance, it would probably be mapped as a distinct series of dark-brown recent-alluvial soils derived from basaltic rocks.

The surface soil consists of 6 to 12 inches of a brown or dark-brown loam. The subsoil, to a depth of 24 to 36 inches, is a brown loam or material of heavier texture, and the substratum consists of gravel. Gravel is abundant in surface soil and subsoil, and in many places the quantity is sufficient to hinder cultivation.

The type represents recent alluvium washed mainly from the residual soils, but it contains small proportions of material washed from the loessial soils.

The Beverly loam, dark-colored phase, is confined to a few small, narrow areas. The largest continuous area occupies the valley of Lapwai Creek from Culdesac to its confluence with the Clearwater River at Spalding. Smaller areas lie in Tammany Valley and along Cottonwood Creek and Potlatch River. Others occupy the lower alluvial bottoms of Big Canyon Creek near Peck and of Lawyer Canyon near Kamiah. The surface is generally smooth, and the soil is usually well drained, though in places subject to overflow.

Owing to its protected position in the canyons this soil is well suited to growing vegetables and fruits, and where it is irrigated large yields of fruits, berries, and alfalfa are obtained.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Beverly loam, dark-colored phase:

Mechanical analyses of Beverly loam, dark-colored phase.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
540625	Soil	0.7	2.8	2.5	15.2	24.2	41.2	13.4
540626	Subsoil	.7	4.0	2.7	13.5	24.7	39.7	14.5

CALDWELL SILT LOAM.

The surface soil of the Caldwell silt loam is a dark-gray to brownish-gray or drab silt loam extending to a depth of 10 to 15 inches. It is usually high in organic matter, and becomes black when wet. It is underlain by a grayish-yellow to dark-gray or drab silt loam or silty clay loam, which is somewhat compact when dry. The deeper subsoil is often mottled with gray and yellow, and locally may be slightly calcareous.

Areas of Caldwell silt loam occupy the small bottoms of valleys traversed by indistinct drainage ways, and basins of rather deficient drainage.

The type is of small extent and of little agricultural importance. The largest and most typically developed area is associated with the Palouse silt loam in the valley of Cow Creek, on the Uniontown Plateau in the extreme northwestern part of the survey. (See Pl. II, fig. 2.) Other small and less well-developed areas are mapped in the vicinity of Reubens, south of Masons Butte, and near Vollmer and Nez Perce, where they occupy small elongated valley areas.

The type represents recent alluvium derived mainly from the adjacent loessial soils of the Palouse, Southwick, and Nez Perce series, with small admixtures of material eroded from the residual soils. The surface is flat and the type ordinarily is poorly drained. Where the drainage is adequate the land is farmed in about the same way as the surrounding upland soils. Many of the flats are used at present for the production of hay and pasturage.

ROUGH MOUNTAINOUS LAND.

Rough mountainous land includes areas of undifferentiated soils of a number of series and types, with a large proportion of nonagricultural Rough stony land. The better soils would have been mapped separately had the areas been more readily accessible. The types are mainly of residual origin, material of the Tolo series being prominent. A veneer of loessial material is present over much of the less eroded area, but it is usually too shallow for cultivation.

Rough mountainous land occurs in a single large area forming the rougher part of Craig Mountain and extending from a point within about 2 miles of Culdesac, south and southwest to the junction of the Snake and Salmon Rivers. An eastern extension of this area occupies the rougher southwestern part of Lewis County and extends to the Lewis-Idaho County line. This region is mainly unsettled and without roads or other means of access. Occasional patches of soil occur of sufficient depth and sufficiently favorable topography to permit of cultivation, and in a few places farming has been carried on, but conditions of soil, topography, and settlement do not favor early development, and the expenditure of time and funds necessary in extending a detailed survey to this region was not thought warranted. The boundaries on the map are rather arbitrarily drawn, and represent the approximate zone of contact of the differentiated soils with this rough and inaccessible type of land.

A large part of the Rough mountainous land is covered with timber. The less heavily forested area is largely confined to the canyons of the Snake and Salmon Rivers. Here the slopes are very steep and the soil material so scant that a heavy growth of trees is impossible. The forest consists of yellow pine, fir, cedar, tamarack, spruce, and lodgepole pine. Most of the land has been taken up as timber claims and stone claims. Many of the original owners have sold to lumber

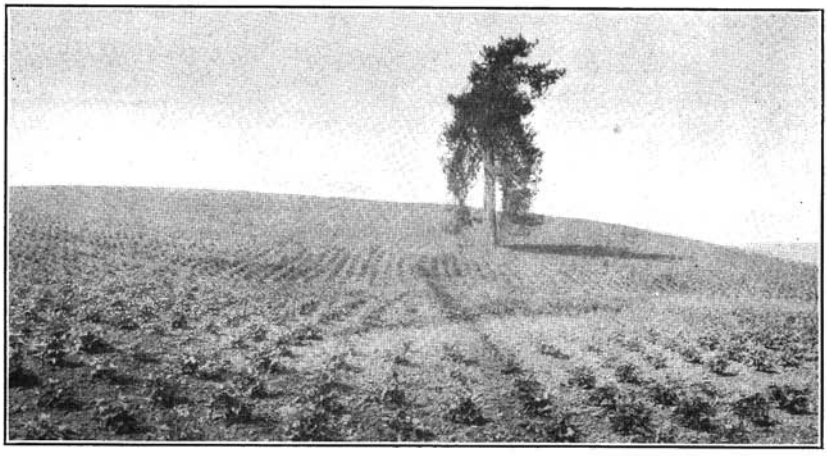


FIG. 1.—BEAN FIELD ON THE SOUTHWICK SILTY CLAY LOAM EAST OF MELROSE.

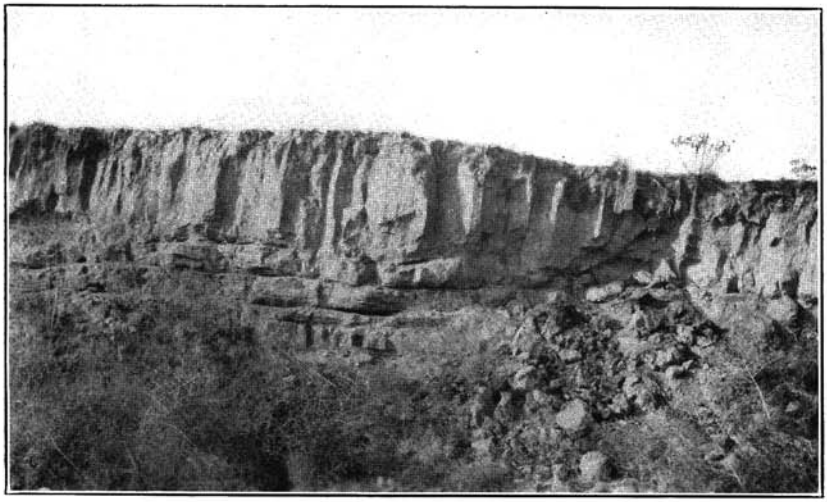


FIG. 2.—EXPOSURE IN THE SAGEMOOR VERY FINE SANDY LOAM, SHOWING STRUCTURE OF SOIL AND SUBSTRATUM OF STRATIFIED BEDS.

companies, sheep raisers, and cattlemen. The land affords fair grazing for sheep and cattle, and is used for this purpose.

ROUGH STONY LAND.

Rough stony land includes the more pronounced steep, rocky slopes of ravines and canyons. These slopes vary in width from a few hundred feet to more than 4 miles. They are incapable of cultivation, but are usually not so steep that they can not be grazed. On a few of the slopes there are small patches of soil which if more extensive would be mapped separately in the Waha series.

Rough stony land is widely distributed throughout the survey. Large areas occupy the steep slopes of the canyons of Potlatch River, Snake River, Clearwater River, and Lapwai, Cottonwood, Mission, Willow, Tammany, Big Canyon, Little Canyon, and Lawyer Canyon Creeks. Smaller areas lie along the lesser canyons and in the eroded valleys of small streams throughout the survey. The areas form the eroded escarpments and margins of the adjacent plateau surfaces. The Clearwater escarpment presents an important development of this type.

Many of the north slopes are timbered, but the south slopes are usually barren, except for a scant growth of small brush and some bunch grass. On the slopes which are not very steep there is a good covering of grasses which afford fair pasturage. During the dry summer months the grass cures on the ground, and although the pasturage is less inviting the cattle continue to graze in midsummer.

The presence of these steep canyon slope areas has hindered the general development of the country. The stream canyons have cut deeply into the plateaus, and a large expenditure of labor and money has been necessary to connect isolated areas with roads. There are many carefully graded roads from the upland areas to the towns and railroads, which are usually situated at the bottom of the canyons. Seven of these roads lead into the town of Peck, for instance, each making a climb of about 2,500 feet from that town to the upland plateaus.

RIVERWASH.

Riverwash consists of sand, gravel, and bowlders occupying stream beds, overflow channels, and small included islands, spits, and bars. It usually contains very little fine soil material.

This is an inextensive soil, of variable character and of little importance. It is confined to a few small areas along the Clearwater River, the most prominent occurring in the vicinity of Lewiston, Spalding, Lenore, and Peck. Numerous small, unimportant areas are included with the Beverly soils or with the Rough stony land of the narrow stream and canyon bottoms. The type occupies a few

islands in the Clearwater and Snake Rivers and some small strips of stream bottom which are swept by high water each year. The higher parts of these areas have some grass growth, while the lower parts are covered with willows. Riverwash is nonagricultural.

IRRIGATION.

In 1910, according to the census, there were 5,360 acres actually under irrigation in Nez Perce County, which at that time included the present areas of Nez Perce, Lewis, and Clearwater Counties.

The table below shows the areas included in commercial and private irrigation projects in 1909:

Areas in irrigation projects, Nez Perce County.

Project.	Area.
	Acres.
Commercial enterprises, irrigated in 1909	4,360
Area capable of irrigation in 1910	8,160
Area included in projects	28,000
Individual and partnership enterprises, irrigated in 1909	1,000
Area capable of irrigation in 1910	1,157
Area included in projects	1,896

By far the greater part of the irrigation water is supplied from streams. Of the 5,198 acres watered from stream sources in 1909, only 5 acres were supplied with pumped water, all the remainder being served by gravity canals. The area irrigated with water pumped from wells was 85 acres. Seventy-six acres were irrigated with water from springs and 1 acre from a flowing well.

The largest area under irrigation lies in the low plateau south of Lewiston. This area is about 6 miles long and from one-half mile to 2 miles wide. The water is obtained from Sweetwater Creek, about 10 miles south of Fort Lapwai, and is carried by a gravity ditch into a storage reservoir located at the east end of the project. Owing to the general slope to the west, the distribution of irrigation water by means of buried pipe lines is easily accomplished. The land in this project is divided into 5 to 100 acre lots. A paved road from Lewiston extends through the middle of the tract, making the transportation of the products to market easy and rapid. There are many well constructed, desirable houses within the Lewiston Orchard Tract.

A small tract is irrigated on the north side of the Clearwater River near Lewiston, the water being obtained by pumping from the Clearwater River. In the Lapwai Creek Canyon another is watered from Sweetwater Creek. Irrigated gardens, many of which are

maintained in connection with the upland dry-land farms, are usually situated in the canyons. Most of the water is obtained from springs higher up in the canyons.

The principal crops thus produced are orchard fruits, grapes, vegetables, alfalfa, and potatoes. The yields indicate that the soils under irrigation are productive.

SUMMARY.

Nez Perce and Lewis Counties are situated in the west-central part of the northern extension of the State of Idaho, known as the Panhandle.

The area consists mainly of gently sloping plateaus traversed by deeply cut stream canyons. The highest elevation, on Craig Mountain, is a little over 5,000 feet; the lowest, about 700 feet, is at Lewiston.

The Snake, Salmon, and Clearwater Rivers are the main drainage ways.

The settlement of this area began in the early sixties. The population of Nez Perce County in 1917, according to records of the county assessors, was 14,350, and of Lewis County 9,500. Lewiston had a population of 6,043 in 1909.

Branch lines of the Northern Pacific Railway and of the Oregon-Washington Railroad & Navigation Co. furnish the rail transportation. The Snake River is navigable for steamboats to a point 30 miles above Lewiston.

Wheat, barley, and orchard fruits are the principal products exported.

Much of the area was formerly covered with bunch grass, which afforded grazing for large numbers of cattle. The higher rolling country is an important grain growing section. In the lower lying country around Lewiston orchard fruits, grapes, berries, and alfalfa are the principal crops. Here considerable areas are irrigated.

The climate of the low country adjacent to Lewiston is mild. In the higher part of the area, as on the Nez Perce Prairie, the winters are more severe, but the summers are dry and pleasant. The average growing season at Lewiston is 203 days in length, and at Nez Perce, 113 days.

The soils of Nez Perce and Lewis Counties are derived from residual, loessial, old lake-laid or stream-laid, and recent alluvial material. Basalt rock underlies most of the area, but small outcrops of granite are encountered in different parts of the two counties.

Thirteen soil types and phases, belonging to nine series and three miscellaneous types, are mapped in this survey.

The Tolo silt loam, with a shallow phase, represents the yellow to light yellowish brown, timbered residual soil derived from basalt. It is developed on Craig Mountain and on the slopes to the east.

The Waha silt loam is a dark-brown to black soil, residual from basalt. It is widely distributed throughout the two counties. The soil material is usually shallow.

The Moscow loam is residual from granite and associated quartz-bearing, crystalline rocks. The largest area occurs southeast of Winchester surrounding Masons Butte. The soil is brown in color and is underlain by a lighter brown or yellowish-brown subsoil.

The Palouse silt loam is extensively developed in the north-central part of the survey. It is a very dark grayish brown to black soil, of loessial origin, used mainly for growing wheat, barley, oats, and timothy.

The Nez Perce silt loam and its friable-subsoil phase occupy the prairie part of the Kamiah Plateau. The surface soil is dark grayish brown to black, underlain by a tough impervious subsurface layer and a brown or reddish-brown subsoil. The Nez Perce series is of loessial origin. Wheat, barley, and oats are the principal crops grown on these soils.

The Southwick silty clay loam occupies areas which are or were once in forest. It has a dark-brown soil, with a brown or reddish-brown, compact subsoil. The type is of loessial origin. It is well adapted to the growing of beans, especially at the lower elevations. It is also well suited to barley, wheat, timothy, and oats.

The Sagemoor very fine sandy loam and silt loam are derived from old lake or stream laid materials. They are most extensive on the Lewiston Plateau. The surface soils are brown to light brown in color, with light-brown to gray, calcareous subsoils. These types are used mainly in growing fruits, berries, grapes, and vegetables under irrigation.

The Beverly series, represented by the fine sandy loam and a dark-colored phase of the loam occupies the bottoms of the principal streams. The surface soils of this series are brown. The Beverly soils are used mainly for trucking and the growing of small fruits.

The Caldwell series, represented by the silt loam, consists of recent alluvial material washed from loessial soils and occupying poorly drained bottoms and local basins traversed by indistinct drainage ways. The soil is dark gray to black in color with a gray to drab and frequently mottled subsoil. The Caldwell silt loam is used mainly for pastures and for hay production.

Rough mountainous land includes the rough, broken part of Craig Mountain and a dissected area in the southern part of the two counties. It is forested, but is used for grazing.

Rough stony land includes the steep, stony escarpments and slopes of stream canyons.

Riverwash includes coarse deposits lying immediately along streams and subject to frequent overflow. The land is unfit for cultivation.

There were 5,360 acres under irrigation in the two counties in 1909, most of the irrigated area being in the vicinity of Lewiston. Water for this purpose is obtained largely from streams and is delivered to the land by gravity.

[PUBLIC RESOLUTION—No. 9.]

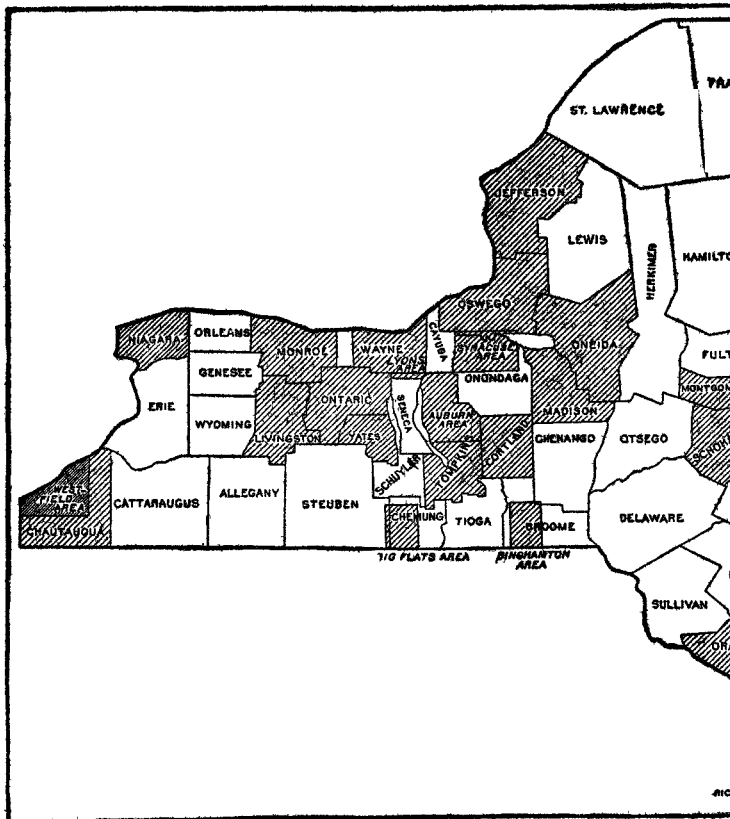
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed; in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]



Areas surveyed in New York.

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U.S. DEPT. OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY, CHIEF
CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL MAP

IDAHO

NEZ PERCE AND LEWIS COUNTIES SHEET

UNIVERSITY OF IDAHO
AGRICULTURAL EXPERIMENT STATION
J.S. JONES, DIRECTOR

CONVENTIONAL SIGNS

CULTURE
(Printed in black)

City or Village, Roads, Buildings, Wharves, Settlee, Breakwater, Levee, Lighthouse, Fac.

Secondary roads and Trails

Railroads Steam and Electric

Bridges, Ferry

R.R. crossings, Tunnel

Ford, Dam

School or Church Cemeteries

Mine or Quarry Mine dump Made land

Bluff, Escarpment, Rock ledges and Triangulation station

Stony and Gravelly areas

Soil boundaries

Boundary lines

Boundarylines

Boundary lines

U.S. township and section lines

RELIEF
(Printed in brown or blac

Contours Depression contours

Prominent Hills Mountain peaks

Sand, Wash, and Sand dunes

Shore and Low-water line, Sandbar

DRAINAGE
(Printed in blue)

Streams

Lakes, Ponds, Intermittent lakes

Intermittent streams

Springs, Canals and Ditches, Flumes

Swamp Salt marshes

Submerged marsh Tidal flats

The above signs are in current use on the soil maps of Idaho, but all may not appear in some maps of earlier date.

LEGEND

Palouse silt loam — Px	Tolo silt loam — T
Waha silt loam — W	S Shallow phase
Nez Perce silt loam — N	Sagemoor very fine sandy loam — Sv
Friable-subsoil phase	Sagemoor silt loam — Si
Southwick silty clay loam — Ss	Beverly fine sandy loam — Bs
Moscow loam — Mc	Beverly loam dark-colored phase — B
Caldwell silt loam — C	Rough stony land — R
Riverwash — Rv	Rough mountainous land — Rl

Mary H. Lapham, Inspector, Western Division.
Soils surveyed by J.H. Agee, of the U.S. Department of Agriculture, in charge, and P.F. Peterson, of the University of Idaho.

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1917